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CATARACT EXTRACTION.*

By E. C. RIVERS, ~~A. M.~~, M. D.,
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THE operation for extraction of cataract is the most important the oculist has to perform. It may not require more skill or judgment on his part than other eye operations, but the results to the patient of having sight restored to a blind eye are so great that the subject must always be one particularly fascinating to both patient and doctor. In a matter of such moment it is not surprising to find wide divergence of opinion as to the values to be placed on different methods of operating, or different instruments or manipulations to be used in certain steps of the operation, and conflicting opinions by operators of apparently equal ability in regard to the best dressings and after-treatment to be employed.

I do not propose, however, either to present here an epitome of the history of the operation for extraction, or to pose as a critic of other more able and experienced operators, even if time was sufficient and my ability to do so unquestioned.

My object is simply to give an account of my own ex-

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perience in this line, hoping it will prove of some interest, if not on account of methods and means that have proved of value in my hands, at least that any failure or mistake on my part might be instructive.

In order that any value can be attached to a paper of this kind, it is necessary that all the extractions done by one person, whether followed by good or bad results, should be given. For this reason I have not neglected to give every case recorded in my record books, or that I could remember with sufficient accuracy, of operation done long enough ago to have the result determined. This is my apology for bringing to your attention some cases which, possibly, some of you will think had better been left buried in the past.

The cases have not been selected in any way, but have been all those in which an extraction of a cataract, whether complicated by other disease of the eye or not, seemed to your reporter to be the best interest of the patient. In this number, however, I have not included cases of dislocated lenses removed.

The whole number of eyes operated on is fifty-one, in thirty-eight individuals, the youngest about twenty-three years old, the oldest eighty-four years and six months.

In enumerating the results, all in which vision amounted to $\frac{10}{200}$ or more have been called successful; of these we have forty-four. In only one of these was vision as low as the minimum. All cases not followed by such improvement will be related more at length.

Of the successful cases, one was a Morgagnian cataract, with adhesions to the iris. One had a very peculiar dark streak, extending from the center to the periphery (below) of the capsule, easily seen with the naked eye on examination, and at first thought to be a foreign body, but proved not to be.

One patient, aged thirty-two, had punctate opacities in the lower portion of Descemet's membrane. No history of pain or injury to eye. Operation, with iridectomy, smooth and successful. One patient broke out, two or three days after the operation, with a severe facial erysipelas. The eye was not affected, and wherever the skin was covered on the cheeks and forehead by the bandage, the inflammation did not extend. One other case needs to be spoken of on account of its being caused by a small piece of iron in a man about twenty-three years old. The lens was extracted; no foreign body found; results good. Only one patient got vision = 1. This was the only eye the patient had. The opacity was confined to the central part, and apparently not increasing, the vision remaining the same for over a year. He had no difficulty in getting around but his sight was not good enough for him to work. Iridectomy was performed, the lens was expelled without difficulty, and, much to my surprise, it came away altogether and was perfectly hard. In two other cases vision was nearly equal to 1. One had had a slight corneal cloud since childhood. As stated above, only one case was as low as $\frac{1}{200}$, and that could be improved by further operation on the capsule, but the patient is unwilling to risk any loss of what sight he has.

Dissection of the capsule was performed in thirteen cases. Several other patients could have increase of vision by the same means. The secondary operation caused great damage by supuration of the vitreous in one eye operated on successfully three years before. The patient was operated on with the knife made for this purpose, and bandaged with antiseptic precautions. Thirty-one hours afterward severe pain began in the eye, with loss of vision. Examination showed suppuration in the anterior portion of the vitreous and slight cloudiness at the point of puncture in the cornea. He was a hospital patient, and had freely bathed his eye after I had left him with the holy water in the hospital chapel, undoubtedly producing the infection.

Of those not classified as successful, one patient, who did not have perception of light, was operated on at his own request for cosmetic effect alone. Examination after-

ward showed extensive vitreous opacities. One patient was operated on at his request, although great doubt existed whether all the opacities visible were in the lens. Here also extensive vitreous opacities were found. In both these cases the corneal wound healed perfectly and the pupil remained open and black. Vision of course was not improved.

During the past few years a return has been made in great measure to the old method of "simple extraction"—that is to say, without an iridectomy. Among my fifty-one cases eight have been done by this method and forty-three with an iridectomy. I have found in this small number no difference in the average of vision obtained.

When the lens is hard and I have reason to think there is not much cortical substance, I perform the simple operation, provided no unlooked-for occurrences necessitate excision of a piece of iris. In expelling the lens through the natural pupil I go slowly, giving the pupil time to dilate under the pressure as it passes through. In one case, where a simple operation was intended, I was obliged to iridectomize on account of the rigidity of the sphincter pupillæ; in another, on account of the iris falling over the edge of the knife and being wounded. In all cases of simple extraction I place my incision in the clear cornea, after the manner of Dr. Bull, and have the apex of the flap one or two millimetres above the opaque portion of the cornea. This always makes the iridectomy more difficult to perform if it becomes necessary, but prevents prolapse of the iris. It makes more difficult the making of a smooth incision, the edge of the flap often being irregular, and consequently increasing the astigmatism. Where iridectomy is to be done, I place my incision as near the corneal edge as possible, but do not make a conjunctival flap.

In opening the capsule, I usually, in both methods, use

a Knapp's knife and open it freely on the anterior surface. In simple extraction I pay no attention to the prolapse of the iris, which usually takes place on completing the corneal incision, except not to injure it in any way. In the majority of cases it returns to its proper position spontaneously after the lens is removed, or can easily be replaced with a spatula.

In expelling the lens I always use the spatula, and in some cases, when the patient is under good control, make counter-pressure with the fixation forceps over the posterior flap of the wound. To remove cortical substance, if necessary, I irrigate the anterior chamber with water that has been boiled and is still warm, or boric-acid solution, by means of an ordinary pipette that has been disinfected. The point is only inserted at one corner of the wound sufficiently to allow the fluid to enter the eye.

The two most serious objections I have found to the simple extraction are the difficulty of removing the cortical substance and the almost invariable iritis followed by posterior synechiæ, only two of my eight cases being free of the latter. In several they were only slight. The small size of the pupil after this method prevents any free laceration of the capsule afterward if it should become desirable. Fortunately, I have had no case of prolapse of the iris.

Every patient I operate on by either method is treated for several days previously by a solution of bichloride (1 to 5,000) three times a day, and any conjunctival or lacrymal trouble is first removed as far as possible. Atropine is employed to determine the condition of the lens and iris in all cases. Just before operating I disinfect the eye and surrounding parts with either the bichloride or a saturated solution of boric acid. My instruments are cleansed with hot water and usually placed in alcohol, from which they are taken as needed. My hands are cleansed with soap and

hot water. I always use a speculum and remove it only at the completion of the operation, when the eye is thoroughly washed with a solution (saturated) of boric acid, and cotton wet with the same is placed over both eyes and held in place by a roller bandage. When ready to remove the speculum I always caution the patients not to close the lids tightly, as they feel like doing after the stretching of the instrument, but let them come together very lightly. I do not now use eserine, even in weak solutions, after the simple extraction, to contract the pupil, as I do not think it necessary or scientific. With the high incision, if a prolapse of iris should occur, it would be much larger with a contracted pupil than if the eserine had not been used. In one or two of my eight cases I filled the eye, before applying the compress and bandage, with a solution of atropine, eight grains to the ounce. I not only got no prolapse, but I noticed little if any difference in the posterior synechiae following in these cases and in those in which I had used eserine. I do not consider that I increase the danger by using atropine, as it will not dilate the pupil as long as the anterior chamber is open; and as soon as the anterior chamber is sealed, by the corneal wound uniting, the danger of prolapse is removed.

My after-treatment is regulated by the amount of pain experienced. The bandage is usually removed, the outside of the lids cleansed with the boric-acid solution, and the cotton changed at the end of twenty-four or forty-eight hours. On the third day usually I begin using atropine drops twice daily. If the patient has had no pain I do not examine the eye until the fourth or fifth day. On the fifth I leave the unoperated eye open if it has any vision.

Most of my patients are operated on at their homes, but not necessarily on their beds. I operate usually at three o'clock in the afternoon. I require my patients to remain

where operated on until bed-time, when they are allowed to walk to the bed and are made to remain there according to what I think best for each individual case—usually until the fifth day. I never operate on both eyes at one time, preferring to give the patient every chance to get at least one eye with useful vision.

The accident of least moment happening to me during the operation has been that twice, by a sudden movement of the eye during the passage of the knife through the anterior chamber, the aqueous has been evacuated. In both cases I cautiously withdrew the knife and waited, with the eye covered by a compress, until the chamber refilled, and then completed the operation. No trouble followed in either instance. The more serious accident I have had was once when I made the counter-puncture.

The patient became frightened and suddenly pulled away from me violently and sat up before I could release my hold upon the knife, completing not only the corneal incision, but also expelling the lens in the capsule, together with considerable vitreous adhering to it, on to the sleeve of my coat. I instilled atropine solution and applied a bandage and cotton. The patient recovered with V. = $\frac{10}{200}$, which, as above stated, could be improved by needling the pupillary membrane present, but the patient prefers to stay as he is. The patient was unnerved by my pointing out the steps of the operation to the students near by. Now I operate with my mouth shut.

In three eyes I have had dislocation of the lens, two of these in the same individual, an old man of seventy-five years, with trembling irides, due to a fluid condition of the vitreous. As soon as the lenses were touched they sank out of sight. I fished up one, and removed it from the fundus of the eye; but neither eye had any vision, except perception of light, even after the lens had disappeared from the pupil.

The other was in a man nearly as old—seventy-four years—who was *non compos mentis*, and would not keep his eye still during the delivery of the lens. About half the lens was expelled, when there was loss of vitreous, and the remaining portion of the lens was dislocated upward out of sight. Several attempts to recover it only produced more loss of vitreous. The eye was closed with the usual dressing. The patient at first had good vision, but after about six months the eye was lost by iridocyclitis.

It would have been better to continue my attempts until I recovered the dislocated lens, but I did not then know enough to do so.

One case was lost by using a general anæsthetic badly administered. The eye had previously been iridectomized for glaucoma—in a very nervous old lady, who insisted upon having ether given her by her family physician. The administrator allowed the patient to come from under it just as the operation was completed. The vomiting and uncontrollable actions of the patient caused extensive loss of vitreous in spite of the compress of cotton held over the eye to prevent it. Inflammation followed with closure of the pupil, vision being equal to perception of light. Only one other patient had any loss of vitreous, occurring as the speculum was removed; this one recovered with good vision. One case, intended to be a simple extraction, was iridectomized on account of the iris falling before the knife and being wounded in making the incision. Vision = $\frac{2}{3}$.

During the after-treatment several slight accidents, such as injuring the eye by the hand or striking it against objects, have happened, but none have been followed by serious results.

In two cases there has been suppuration, besides the one above stated, following discission. One was one of my first cases. No antiseptic precautions were employed. Suppuration began on the fifth day. The pupil was finally blocked by thick inflammatory membrane. It was afterward incised with De Wecker's

iris scissors, but the vision thus gained was soon lost by closing of the pupil made. The other was in a case of simple extraction, and began twenty-one days after the operation—after the patient was allowed out of the house. All sight for a time was lost, but the vitreous, to which the suppuration was confined, under atropine and constant hot, moist applications, cleared up. Vision = $\frac{2}{7}$ at the last examination without further operative procedures. After the suppurative process had ceased, a point of iris was observed adherent to one corner of the corneal wound. Whether a small portion of the wound failed to unite thoroughly, giving entrance later to some pyogenic micrococci or not, can not be stated positively, but such was my opinion.

To recapitulate, I have operated in all fifty-one times.

Forty-four of these have been successful in restoring useful vision. Seven patients have not recovered vision. Of these seven, two, although the operation was successfully done, were not expected to regain any vision, on account of other eye troubles. Two others had eyes with fluid vitreous, and it was very doubtful if the blindness was due to the cataracts alone. However, these operations as performed would not have been successful if there had been vision in the eyes. Three cases were lost through causes directly connected with the operation and treatment, and which possibly might have been prevented—viz., one of dislocation of the lens, one of suppuration, and one due to the effects of the ether passing away too quickly. Of the fifty-one, eight were done without iridectomy, of which none were unsuccessful, and forty-three with iridectomy, including all the complicated cases and all the losses. Four per cent. of cocaine in a saturated solution of boric acid was used in nearly all cases.



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